Make sure you justify your statements completely and carefully.

1. Consider the ternary $[13, 10]$ Hamming code with check matrix

$$
\begin{bmatrix}
1 & 0 & 1 & 2 & 0 & 1 & 2 & 0 & 1 & 2 & 0 & 1 & 2 \\
0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\
0 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 2 & 2 & 2
\end{bmatrix} .
$$

Decode the received word

$$
(1, 0, 1, 1, 2, 1, 2, 2, 2, 2, 2, 2, 2) .
$$

2. Problem 4.1.5 from the **Notes**.

3. Problem 4.1.9 from the **Notes**.